

# Non-BAC/Charm-Beauty Separation



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# C/B Separation

- c/b Separation Achieved
- DCAs (2D) fit with following functions after Akiba's cuts applied

D or B Mesons Only

$$f(x) = Ae^{-\omega\sqrt{x}}$$

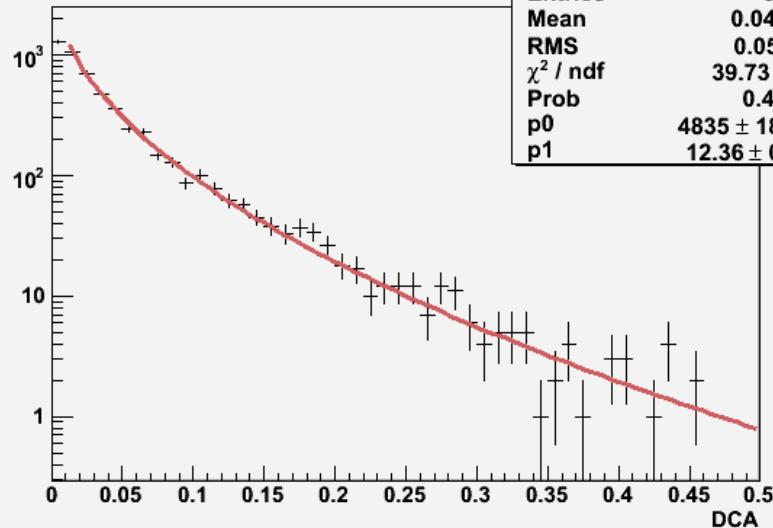
Both Together

$$f(x) = A_D e^{-\omega_D \sqrt{x}} + A_B e^{-\omega_B \sqrt{x}}$$

- Integrate to get yields

# DCA Fits (No $P_t$ Restrictions)

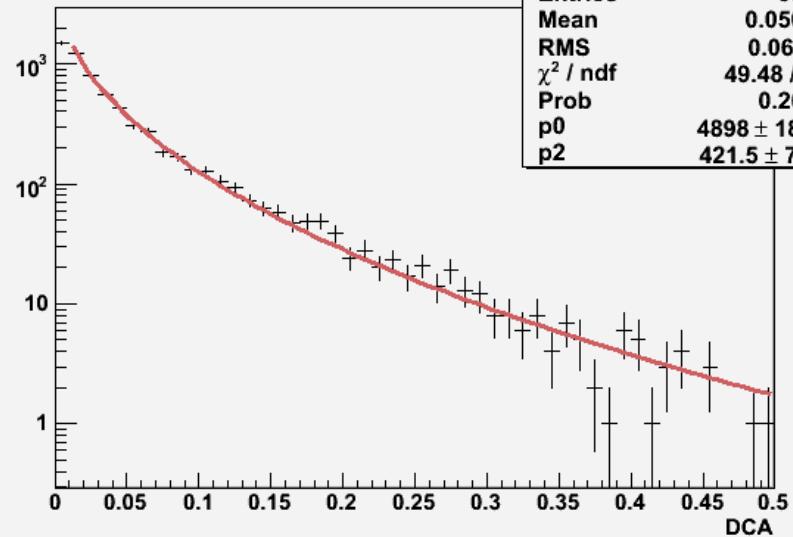
DCA of D Meson Electrons



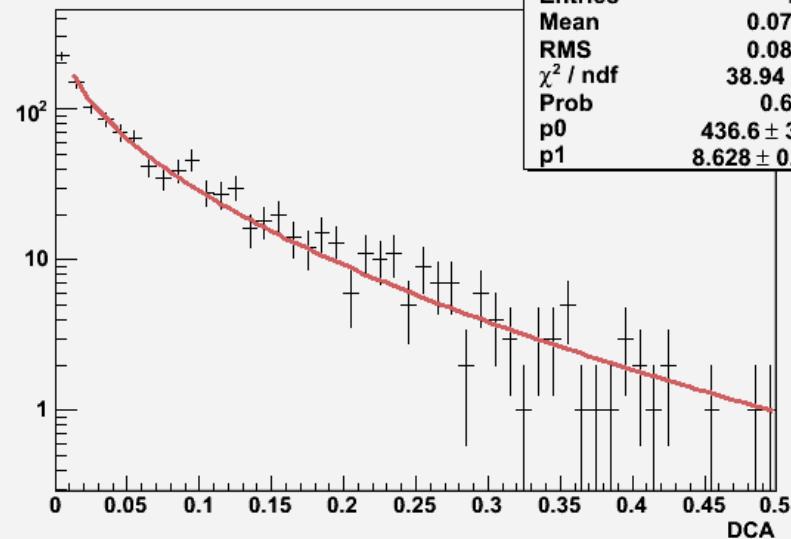
DCA of D Meson Electrons

Entries	5377
Mean	0.04529
RMS	0.05731
$\chi^2 / \text{ndf}$	39.73 / 40
Prob	0.4824
p0	4835 ± 183.4
p1	12.36 ± 0.16

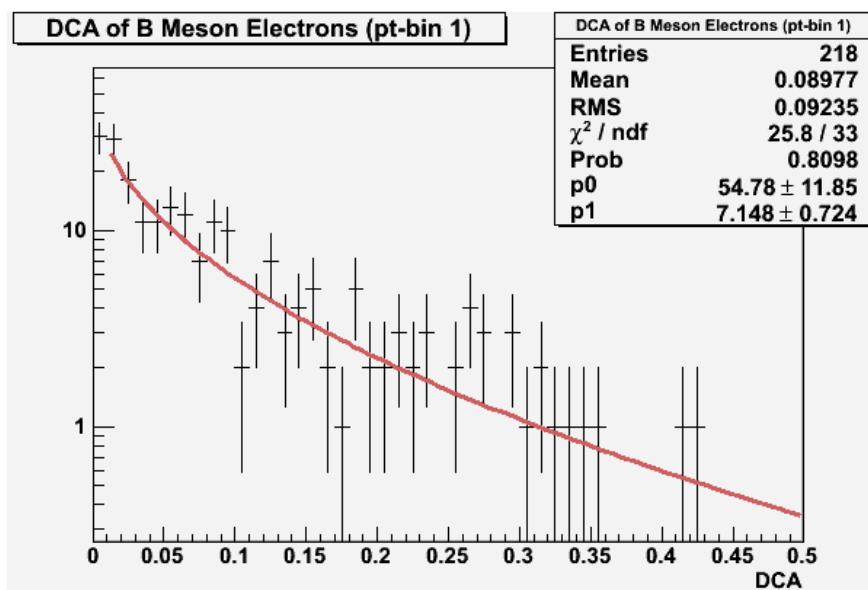
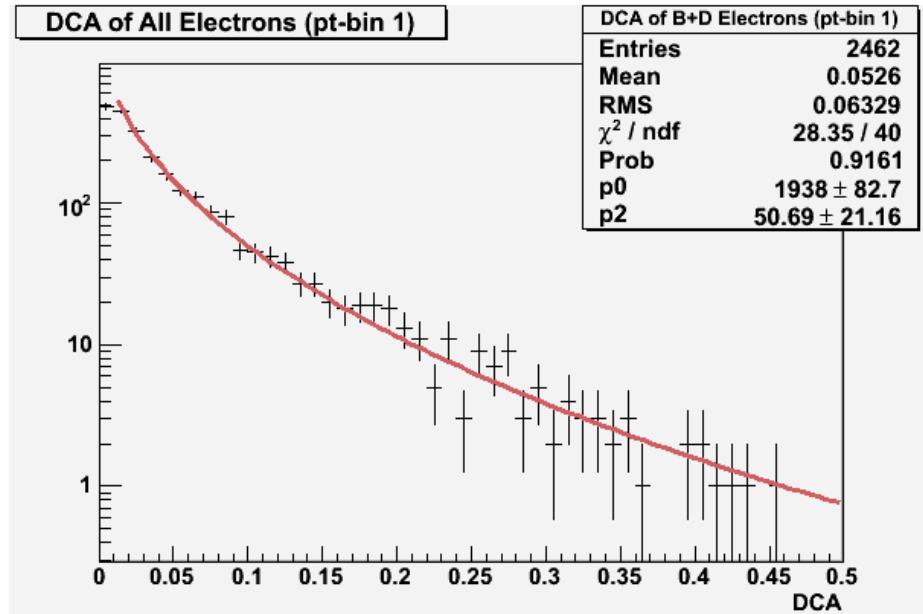
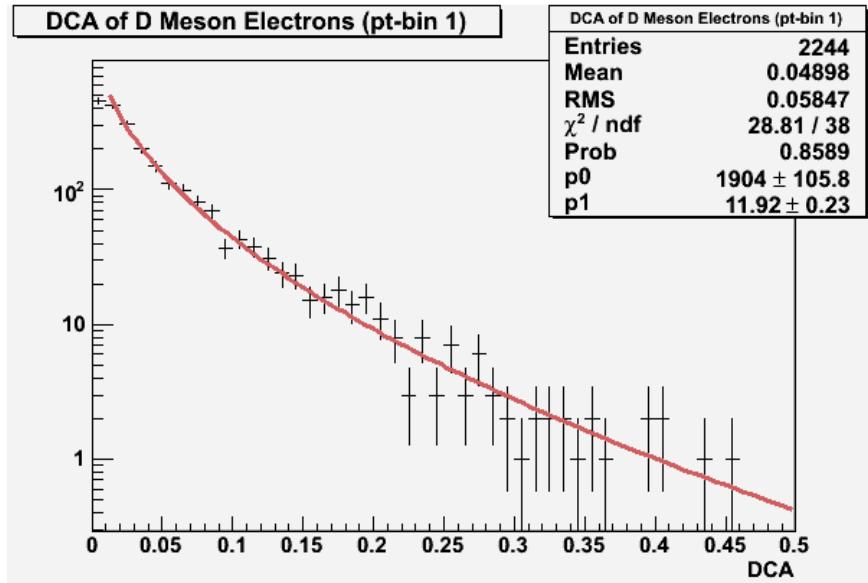
DCA of B+D Electrons



DCA of B Meson Electrons

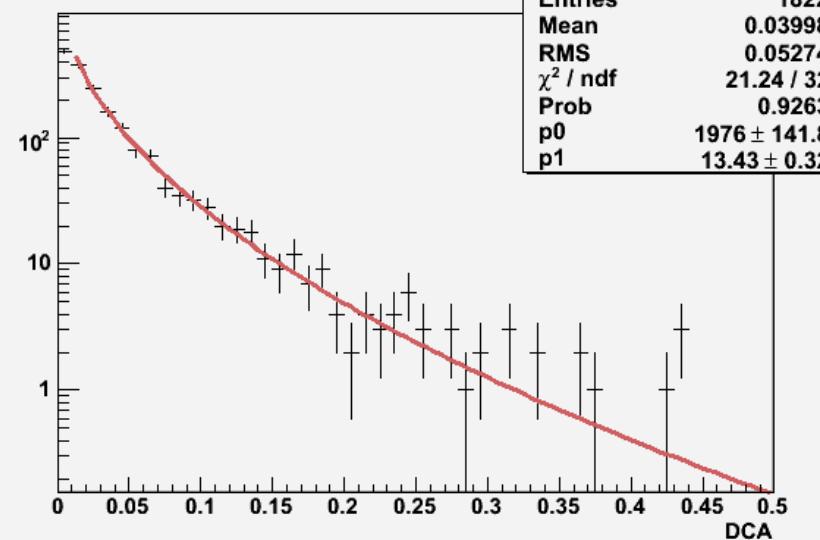


# DCA Fits ( $0.75 \leq p_t < 1.25$ GeV/c)



# DCA Fits ( $1.25 \leq p_t < 1.75$ GeV/c)

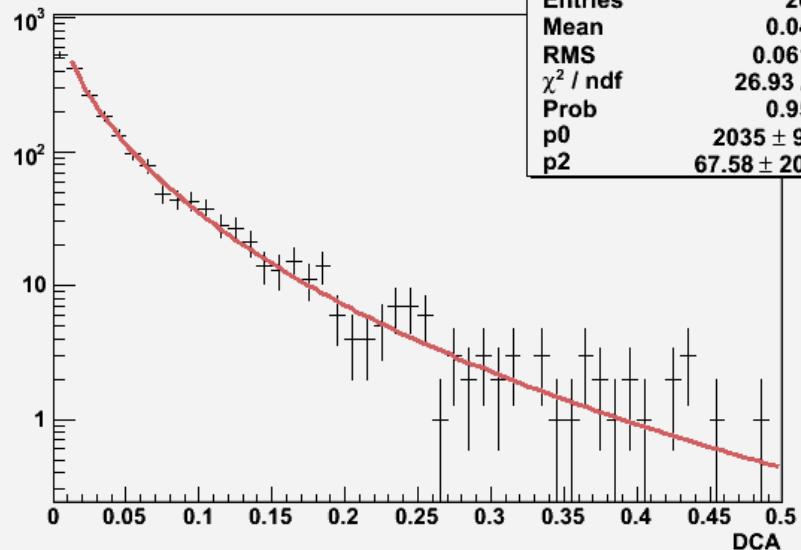
DCA of D Meson Electrons (pt-bin 2)



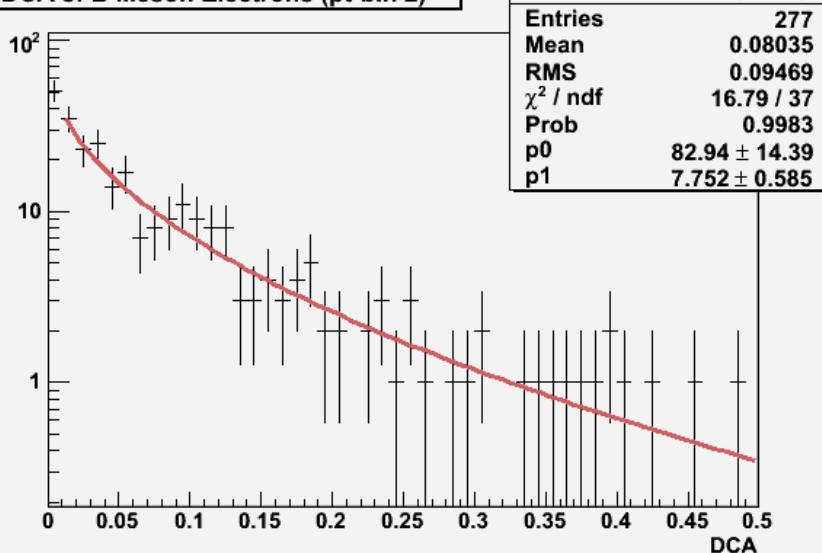
DCA of D Meson Electrons (pt-bin 2)

Entries	1822
Mean	0.03998
RMS	0.05274
$\chi^2 / \text{ndf}$	21.24 / 32
Prob	0.9263
p0	$1976 \pm 141.8$
p1	$13.43 \pm 0.32$

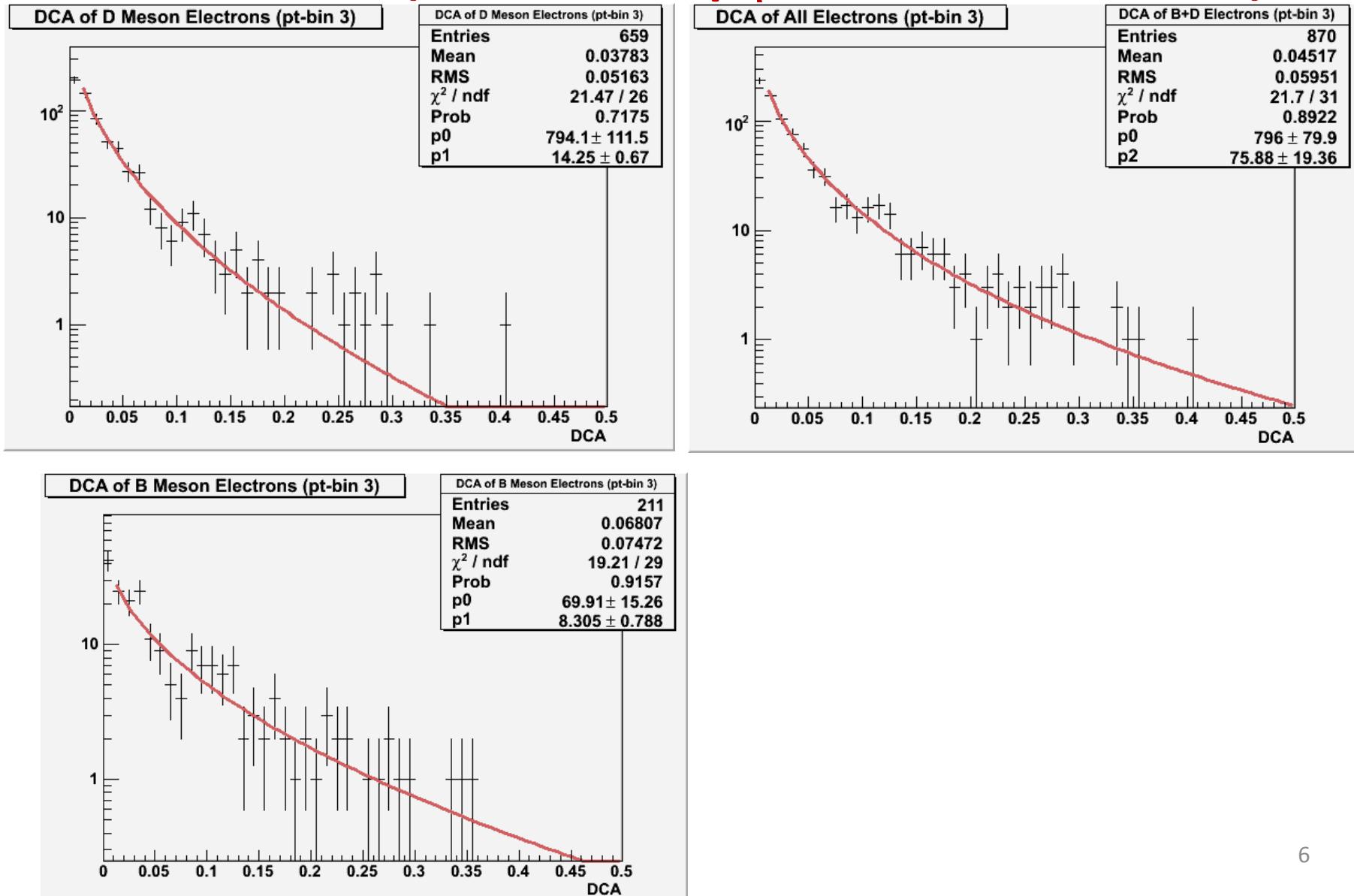
DCA of All Electrons (pt-bin 2)



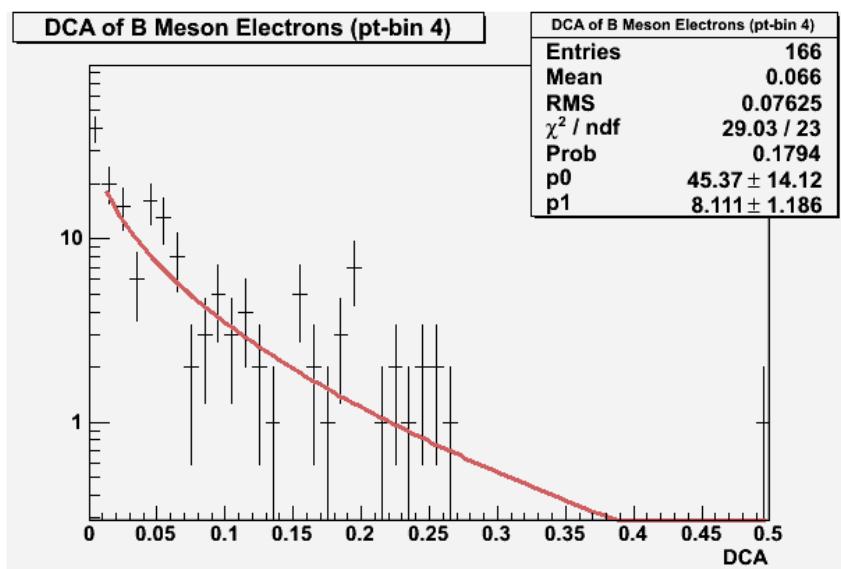
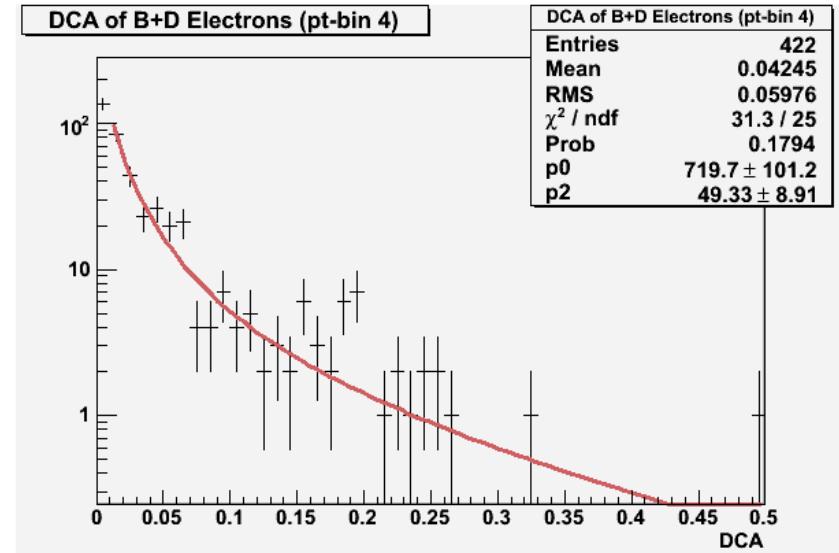
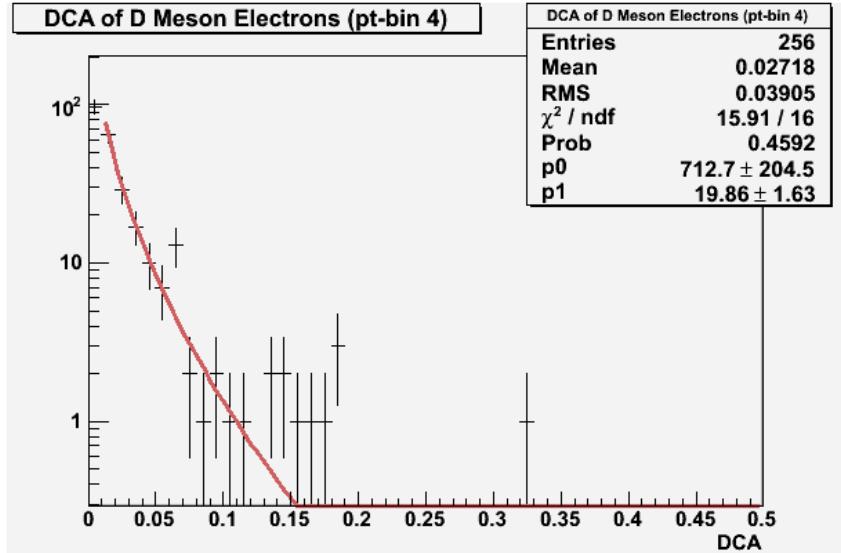
DCA of B Meson Electrons (pt-bin 2)



# DCA Fits ( $1.75 \leq p_t < 2.25$ GeV/c)



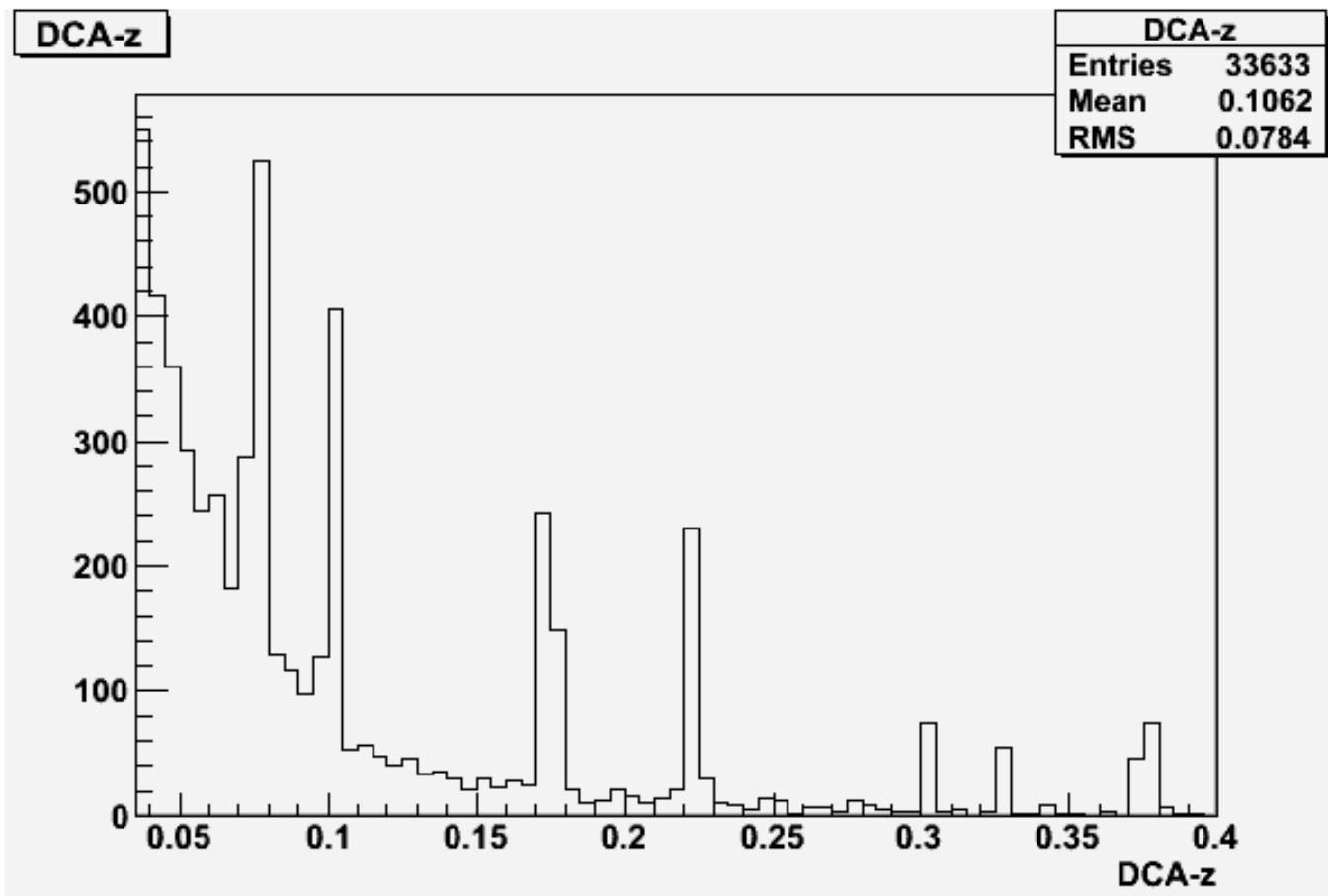
# DCA Fits ( $2.25 \leq p_t < 2.75$ GeV/c)



# Ratios

P <sub>t</sub> Range	Combined fit	Input (separate D and B fits)	Percent Difference
No Restriction	0.18+/-0.03	0.19+/-0.02	4.7%
0.75 to 1.25 GeV/c	0.07+/-0.03	0.080+/-0.02	-9.1%
1.25 to 1.75 GeV/c	0.10+/-0.03	0.13+/-0.03	-21%
1.75 to 2.25 GeV/c	0.28+/-0.08	0.26+/-0.09	8.3%
2.25 to 2.75 GeV/c	0.41+/-0.09	0.38+/-0.21	7.7%

# Why not use 3D DCA's?



- Spike Problem from strips in z-direction

# What's Needed Now

- More Statistics
- Calculated how DCA slope depends on  $p_t$
- Find out how to handle backgrounds (Dalitz, etc...)
- Try Using Sasha's Functions
- Should "D" mesons be broken up into  $D^0$ ,  $D^{+/-}$ ,  $D_s$ ? (probably – due to very different decay lengths)
- How about "B"s? (probably not)